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Photodynamic processes in CaF2 crystals activated by Ce 3+ and Yb3+ ions

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Abstract

The photochemical properties of CaF2 crystals activated by Ce3+ and Yb3+ ions are studied. A model of the photodynamic processes induced by pumping UV or VUV radiation in active media is suggested and experimentally verified. This model explains both the presence of color centers of electronic and hole nature in crystals activated by cerium and the mechanism of suppressing of solarization processes after additional activation of the samples by Yb3+ ions. The cross sections of the processes of free-carrier capture by various ytterbium impurity centers are estimated. These impurity centers are established to be effective centers of recombination of free carriers of both signs. © 2005 Pleiades Publishing, Inc.

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